

PART D. COMPARISON OF ALTERNATIVES

D.1 INTRODUCTION

D.1.1 BACKGROUND

Part D of this EIR/S summarizes and compares the environmental advantages and disadvantages of the various project alternatives fully evaluated in this EIR/S and presents the environmentally superior alternative pursuant to CEQA Guidelines Section 15126. This discussion is provided to help the reader understand the major differences in impacts that are anticipated with the project alternatives.

Upon conducting a screening analysis, appropriate alternatives were selected for full consideration in this EIR/S (see Sections B.3 and B.4). In Part C of this document, the environmental impacts associated with the Proposed Project and these selected alternatives are assessed. A substantial amount of information is presented in Part C because numerous alternatives are discussed and their potential effects extend over many miles of varied terrain. Alternatives that were screened out because they were either infeasible or did not offer the potential for overall reduction in significant environmental impacts, are described in Section B.3 and are not included in this comparative analysis. The following summary comparison focuses on the significant impacts of the fully analyzed alternatives and their major differences, or trade-offs, in impacts. The comparative analysis presented in this Part is intended to provide decision makers with information so that they may make balanced, reasoned decisions on the pending transmission line applications that have been submitted to the CPUC, BLM, and Modoc and Toiyabe National Forests.

D.1.2 COMPARISON METHODOLOGY

The Proposed Project and project alternatives would result in adverse impacts, some of which cannot be mitigated to levels that are not significant. There are many environmental, policy, and economic tradeoffs associated with the alternatives. The environmental analysis upon which the comparison of alternatives and selection of the environmentally superior alternative was based is largely presented in two major parts of the EIR/S as noted below:

- Part C (Environmental Analysis) - Provides a comprehensive and detailed assessment of impacts and mitigation measures for the Proposed Project, each alternative alignment, and the No Project Alternative; parallel, easily comparable treatments are provided in Part C for each issue area.
- Impact Summary Tables (which are part of the Executive Summary of this document) - Tabulate in concise form all the significant impacts and mitigation measures documented in Part C, organized by class of impact, environmental issue area, and alternative.

To assist in the selection of the environmentally superior alternative, a comprehensive alternatives comparison table (Table D.5-1) has been developed, which appears at the end of Part D in Section D.5. In this table, short- and long-term Class I and II impacts are compiled in a matrix format allowing easy comparison among the project alternatives (including the Proposed Project). Within the comparison

matrix, general impact parameters are characterized in the far left column (grouped by environmental issue area in the order of their presentation in Part C and the Executive Summary of the EIR/S — e.g., Air Quality, Biological Resources, etc.). For each impact parameter characterized, entries are provided for each of the alternative alignments and their corresponding Proposed Project segments. These entries describe the impacts of each alternative alignment with respect to the general impact parameter or impact type and, where appropriate, indicate comparative or contrasting features.

The issue areas of biological resources, land use, and visual resources are major factors in this comparison due to the potential magnitude or severity of impacts in these areas. In addition, impacts that are of a long duration, or are widespread, are considered to be more important in the comparative analysis than short-term, localized impacts. However, short-term impacts were considered in context of their collective effect, especially in those cases where the long-term impacts were comparable. Other factors such as economic considerations are referenced where they are important for overall environmental evaluation of an alternative, but do not form the critical basis for determining environmental superiority. Pursuant to the CEQA Guidelines (Section 15126), alternatives shall be considered even if they are more costly. It will be up to decision makers to make final determinations on the environmental, economic, and policy tradeoffs associated with the project and alternatives.

The analysis in the following sections begins with identification of the environmentally superior alternative (Section D.2), followed by a comparative discussion which is divided into two sections: Section D.3, a comparison of the Proposed Project with alternative transmission line route alignments and substation locations; and Section D.4, a comparison of the No Project Alternative to the Proposed Project.

D.2 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

D.2.1 ALTERNATIVE ALIGNMENTS

Table D.2-1 presents a summary side-by-side comparison of the Proposed Project and Alternative Alignments. Table D.2-1 reflects consideration of both short- and long-term impacts within each issue area. As Table D.2-1 shows, different alternative alignments are superior in certain issue areas, and in some issue areas there are only slight differences among the alternatives. In order to meet the CEQA requirement to identify an environmentally superior alternative, we focused on the importance of issue areas (e.g., biological resources, land use, and visual resources) that have potential long-term, widespread significant impacts. Even in these limited issue areas, determining a superior alternative was difficult because of the tradeoffs associated with different transmission line alignments. As shown in Table D.2-1 and as discussed below in Section D.3, the Proposed Project and alternative alignments have closely matched impacts such that, in some cases, the clear superiority of one cannot be easily demonstrated.

Table D.2-1 Summary Side-by-Side Comparison of Proposed Project and Alternative Alignments

| Environmental Issue Area | Proposed Project | Alternative Alignment |
|------------------------------------|------------------|----------------------------|
| | Segment A | Segment B |
| Air Quality (short-term) | | + |
| Biological Resources | | ++ |
| Cultural Resources | | + |
| Energy and Utilities | + | |
| Geology, Soils, and Paleontology | | + |
| Hydrology | N | N |
| Land Use | ++ | |
| Noise | + | |
| Public Safety and Health | + | |
| Socioeconomics and Public Services | N | N |
| Transportation and Traffic | ++ | |
| Visual Resources | ++ | |
| | Segment E | Segments D, F, G, H, and I |
| Air Quality (short-term) | + | |
| Biological Resources | ++ | |
| Cultural Resources | + | |
| Energy and Utilities | N | N |
| Geology, Soils, and Paleontology | + | |
| Hydrology | ++ | |
| Land Use | + | |
| Noise | | + |
| Public Safety and Health | N | N |
| Socioeconomics and Public Services | N | N |
| Transportation and Traffic | + | |
| Visual Resources | | ++ |
| | Segment K | Segments J and I |
| Air Quality (short-term) | + | |
| Biological Resources | ++ | |
| Cultural Resources | | ++ |
| Energy and Utilities | | + |
| Geology, Soils, and Paleontology | ++ | |
| Hydrology | + | |
| Land Use | | + |
| Noise | N | N |
| Public Safety and Health | N | N |
| Socioeconomics and Public Services | N | N |
| Transportation and Traffic | N | N |
| Visual Resources | | + |

| Environmental Issue Area | Proposed Project | Alternative Alignment |
|------------------------------------|------------------|-----------------------|
| | Segment L | Segment ESVA |
| Air Quality (short-term) | N | N |
| Biological Resources | ++ | |
| Cultural Resources | ++ | |
| Energy and Utilities | N | N |
| Geology, Soils, and Paleontology | + | |
| Hydrology | N | N |
| Land Use | | ++ |
| Noise | | + |
| Public Safety and Health | N | N |
| Socioeconomics and Public Services | N | N |
| Transportation and Traffic | N | N |
| Visual Resources | | ++ |
| | Segment N | Segment M |
| Air Quality (short-term) | N | N |
| Biological Resources | N | N |
| Cultural Resources | ++ | |
| Energy and Utilities | N | N |
| Geology, Soils, and Paleontology | | + |
| Hydrology | | + |
| Land Use | ++ | |
| Noise | N | N |
| Public Safety and Health | N | N |
| Socioeconomics and Public Services | N | N |
| Transportation and Traffic | + | |
| Visual Resources | + | |
| | Segment Q | Segment P |
| Air Quality (short-term) | | + |
| Biological Resources | | + |
| Cultural Resources | | + |
| Energy and Utilities | N | N |
| Geology, Soils, and Paleontology | + | |
| Hydrology | + | |
| Land Use | ++ | |
| Noise | N | N |
| Public Safety and Health | N | N |
| Socioeconomics and Public Services | N | N |
| Transportation and Traffic | + | |
| Visual Resources | ++ | |

| Environmental Issue Area | Proposed Project | Alternative Alignment |
|------------------------------------|-------------------------|-----------------------|
| | Segment T | Segments S and U |
| Air Quality (short-term) | N | N |
| Biological Resources | ++ | |
| Cultural Resources | + | |
| Energy and Utilities | + | |
| Geology, Soils, and Paleontology | + | |
| Hydrology | + | |
| Land Use | | + |
| Noise | N | N |
| Public Safety and Health | N | N |
| Socioeconomics and Public Services | N | N |
| Transportation and Traffic | + | |
| Visual Resources | | ++ |
| | Segment W (W01 to WN04) | Segment Z |
| Air Quality (short-term) | N | N |
| Biological Resources | N | N |
| Cultural Resources | N | N |
| Energy and Utilities | N | N |
| Geology, Soils, and Paleontology | N | N |
| Hydrology | N | N |
| Land Use | | + |
| Noise | N | N |
| Public Safety and Health | N | N |
| Socioeconomics and Public Services | N | N |
| Transportation and Traffic | N | N |
| Visual Resources | N | N |
| | Segment W (W03 to X01) | Segment WCFG |
| Air Quality (short-term) | N | N |
| Biological Resources | | ++ |
| Cultural Resources | | + |
| Energy and Utilities | N | N |
| Geology, Soils, and Paleontology | N | N |
| Hydrology | N | N |
| Land Use | ++ | |
| Noise | + | |
| Public Safety and Health | + | |
| Socioeconomics and Public Services | N | N |
| Transportation and Traffic | N | N |
| Visual Resources | ++ | |

| Environmental Issue Area | Proposed Project | Alternative Alignment |
|------------------------------------|------------------|-----------------------|
| | Segment Y | Segment X-East |
| Air Quality (short-term) | N | N |
| Biological Resources | | + |
| Cultural Resources | | ++ |
| Energy and Utilities | N | N |
| Geology, Soils, and Paleontology | N | N |
| Hydrology | N | N |
| Land Use | ++ | |
| Noise | + | |
| Public Safety and Health | + | |
| Socioeconomics and Public Services | N | N |
| Transportation and Traffic | N | N |
| Visual Resources | + | |

++ Clear environmental advantage
 + Minor environmental advantage
 N No discernible advantage

Based on information in Tables D.2-1 and D.5-1, the following route alignments, listed from north to south, are considered environmentally superior under CEQA (and are the NEPA lead agency-preferred project alternative, except where noted):

- **Proposed Segment A**, including the proposed Alturas (Devils Garden) Substation site, due primarily to the fact that this route would avoid many of the visual and land use impacts associated with Alternative Segment B that cannot be fully mitigated.
- **Proposed Segment C** (no alternative alignment was identified that offered the potential for environmental advantage)
- **Proposed Segment E**, a somewhat clear choice due to shorter length and avoidance of significant biological effects that could result from Alternative Segments D, F, G, H, and I which would cross a variety of habitats and cause substantial potential impacts to bird species moving up, down, and across the area.
- **Proposed Segment K**, a narrowly superior choice over combined Alternative Segments J and I because of avoidance of substantial grading and associated long-term biological disturbance along Segment J, and avoidance of significant bird collisions associated with east-west trending Segment I and northern portion of north-south trending Segment J in the southern Madeline Plains.
- **Proposed Segment L**, because of clear environmental advantages to biological and cultural resources.
- **Proposed Segment N**, because of clear environmental advantages to visual resources, land use, and cultural resources.
- **Proposed Segment O** (no alternative alignment was identified that offered the potential for environmental advantage)
- **Proposed Segment Q**, due to substantial advantages in the issue areas of land use and visual resources.

- **Proposed Segment R** (no alternative alignment was identified that offered the potential for environmental advantage)
- **Alternative Segments S and U**, considered the NEPA lead-agency preferred alternative because of the avoidance of significant, unmitigable impacts on visual and recreational resources in the immediate vicinity of the formally-designated Lassen Red Rocks Scenic Area, which is managed by BLM. Additionally, the BLM has determined that Proposed Segment T would conflict with visual management objectives identified in the Lahontan Resource Management Plan for the designated scenic area. **Proposed Segment T** is considered the **CEQA environmentally superior alternative** based on concerns regarding potentially higher levels of impact on biological, cultural, and transportation resources associated with Segments S and U.
- **Proposed Segment W**, except for Alternative Segment Z, as discussed below (no other alternative was identified that offered the potential for environmental advantage; W considered superior over WCFG due to avoidance of the land use and visual impacts associated with Segment WCFG).
- **Alternative Segment Z**, due to the avoidance of a residential subdivision and associated land use conflicts.
- **Proposed Segment X** (no alternative alignment was identified that offered the potential for environmental advantage).
- **Proposed Segment Y**, because of the avoidance of significant land use and visual impacts associated with Alternative Segment X-East in the vicinity of Hoge Road.

Section D.3 describes the basis for these conclusions, and presents a summary comparison of the impacts of the Proposed Project and alternative alignments.

D.2.2 SUBSTATION SITES

Alternative sites for both the proposed Alturas Substation and Border Town Substation were evaluated in each issue area in Part C.

D.2.2.1 Alturas Substation

The alternative site to the proposed Devils Garden site for the Alturas Substation is located in Alturas on property known as the Mill Site. This site would be utilized only if Alternative Segment B is selected over Proposed Project Segment A. Similar to Segment A, this site would not be environmentally superior due to significant land use and visual impacts associated with the site's location in close proximity to sensitive land uses and public views. Therefore, the proposed Alturas Substation (Devils Garden site) would be environmentally superior.

D.2.2.2 Border Town Substation

The alternative Border Town Substation site is located just to the south of the proposed substation site and is located on a parcel owned by SPPCo. The impacts of this site are very similar to those identified for the proposed site. The primary difference between the two sites is that the Proposed Project site is further from residences in the area. Therefore, the Proposed Project site is considered to be environmentally superior to the alternative site.

D.2.3 NO PROJECT ALTERNATIVE

Under the No Project Alternative, impacts associated with constructing and operating the Proposed Project would not occur. However, when considering the alternative projects that SPPCo would need to implement to reduce existing system limitations and accommodate future growth, the proposed Alturas Transmission Line Project is considered to be environmentally superior to the No Project Alternative. See Section D.4 for further discussion.

D.3 COMPARISON OF ALTERNATIVE ALIGNMENTS

To facilitate a clear understanding of the relative merits of the various alternative alignments, this Section highlights the major differences among the numerous alternative alignments, including the Proposed Project, with respect to environmental impacts. These alignments would replace a portion of the Proposed Project route, therefore, are compared to the segment of the Proposed Project that they would replace. See Section B.4 (Project Description) for a description of these alternative alignments. Again, please refer to the detailed comparison matrix in Table D.5-1 for supporting information.

D.3.1 ALTURAS AREA ALTERNATIVE SEGMENT B VERSUS PROPOSED PROJECT SEGMENT A

Relative to Segment A of the Proposed Project route, Alternative Segment B would offer the following principal environmental advantages:

- Construction air emissions would be lower due to the fact that the alternative is shorter than Proposed Segment A.
- Impacts on vegetation and special status plants would be reduced as the total amount of affected juniper woodland would be decreased by six acres and only one occurrence of special status plants would be impacted (vs. 16 occurrences on Segment A); reduced overall impacts on wildlife.
- Five potentially significant cultural resources sites would be affected by Alternative Segment B vs. 17 sites along Proposed Segment A.
- Alternative Segment B would require less blasting and would avoid crossing a potentially active fault.

The above advantages of Alternative Segment B would be offset by the following important environmental disadvantages, which result in Proposed Segment A being environmentally superior:

- Alternative Segment B would cross a greater number of sensitive land uses and more developed land uses (residential, commercial, and recreational).
- Alternative Segment B would result in greater visual impacts to the public due to greater prominence of the line and substation and closer proximity to Alturas.
- There would be a greater potential for conflict with utility easements, roadways, and the Alturas Municipal Airport, given the close proximity to the urban area of Alturas.

D.3.2 MADELINE PLAINS ALTERNATIVE SEGMENTS D, F, G, H, I VERSUS PROPOSED PROJECT SEGMENT E

A combination of alternative segments could replace Proposed Segment E. This set of alignments would move the route further from U.S. 395, which has both advantages and disadvantages. The primary environmental advantages include:

- Significant visual impacts along U.S. 395 would be avoided (note that Alternative Segment F would be preferred over Alternative Segment G due to F's greater distance from U.S. 395).
- By completely avoiding U.S. 395 and associated utility easements along the highway, impacts on transportation and utilities would be reduced.
- Eleven potentially significant cultural resources sites would be affected vs. twelve sites along Proposed Segment E.

Key disadvantages, which lead to selection of Proposed Segment E as environmentally superior, include:

- Impacts on vegetation, wildlife, and special status species would be increased because of more and greater variety of habitats crossed, and the potential for bird collisions would be greater due to the fact that Alternative Segments D, F, G, H, and I would run both east-to-west and north-south, effectively bisecting the habitats in two directions. In addition, these agricultural areas are used more frequently by birds than lands along Proposed Segment E which stays to the east side of the northern Madeline Plains.
- More special status plant species would be potentially impacted by the Madeline Plains alternative segments (46 occurrences vs. 9 occurrences of four species).
- Substantially more grading, road improvements, and blasting would be required along Alternative Segment D.
- Alternative Segments F, G, H, and I would have a greater potential for collision impacts on crop-dusting aviation operations, due to their location and combined north-south and east-west alignments
- Greater construction air emissions would occur due to longer route length and more grading.

D.3.3 RAVENDALE ALTERNATIVE SEGMENTS J AND I VERSUS PROPOSED PROJECT SEGMENT K

Environmental advantages compared to Proposed Segment K include:

- Less visual access, visual contrast, and impacts on views from U.S. 395 would occur due to the fact that Alternative Segment J would avoid 5 miles of route along U.S. 395.
- The alternative would be located at a much greater distance from the Ravendale Airport, thus minimizing potential air traffic conflicts.
- Two cultural resources sites would have potentially significant, but mitigable impacts vs. nine sites along Proposed Segment K.

Although Alternative Segment J would be environmentally superior in visual resources to Proposed Project Segment K, the connecting Segment I would result in significant visual impacts, thus reducing

the overall visual advantages of this alternative. Other disadvantages of Segments J and I (all of which combine to render Proposed Segment K environmentally superior) include:

- Overall access to the line along Alternative Segment J would be much more difficult due to its remote location and rugged terrain, requiring construction of new access roads (some of which would be permanent) and significantly more grading and blasting.
- The combination of Alternative Segments J and I would result in significantly greater biological impacts due to a longer overall line length (19.2 miles vs. 15.4 miles) and associated habitat disturbance (big sagebrush scrub, juniper woodland, silver sagebrush scrub, and sage grouse brood habitats) and due to substantial grading needed for access to Segment J. Also, the combination of a north-south route (Segment J) with an east-west route (Segment I) would increase the potential for bird collisions.
- Increased grading and blasting would have the potential to cause greater erosion and potential impacts to groundwater flow.
- Alternative Segment I would present air traffic risks because it is in a crop dusting area.

D.3.4 EAST SECRET VALLEY ALIGNMENT (ESVA) VERSUS PROPOSED PROJECT SEGMENT L

The environmental advantages of Alternative Segment ESVA include the following:

- The primary environmental advantage offered by Alternative Segment ESVA would be avoidance and reduction of significant visual impacts along the U.S. 395 corridor.
- Land use impacts would be reduced by avoiding several residences along U.S. 395.

Despite substantial environmental advantages in land use and visual resources, Alternative Segment ESVA would result in the following disadvantages:

- Impacts on cultural resources would have the potential to be substantially greater along this alignment since this alternative presents impacts of substantially greater degree of difficulty for successful mitigation. In addition, this alternative has the potential of opening new access routes into previously undisturbed areas, thus increasing potential vandalism.
- A greater areal extent of cumulative impacts associated with construction of the Tuscarora Pipeline would occur because the transmission line route would no longer closely parallel the Tuscarora pipeline route through Secret Valley.
- Moving the route away from U.S. 395 would require development of more access roads and would result in more disturbance to previously undisturbed areas, thus causing greater impacts on biological resources, particularly sage grouse leks, big game habitats (pronghorn antelope kidding areas and winter range), and wetland plant communities.

D.3.5 WENDEL ALTERNATIVE SEGMENT M VERSUS PROPOSED PROJECT SEGMENT N

Alternative Segment M would have the following environmental advantages over Proposed Segment N:

- Much less grading would be required.

Relative environmental disadvantages which make this alternative alignment inferior overall to Proposed Segment N include:

- Alternative Segment M would have higher visibility to motorists on Wendel Road.
- There would be greater potential for land use conflicts due to the close proximity of the alternative to a swine facility and the Wendel Solid Waste Transfer Station.
- Potentially significant impacts on cultural resources would occur at two sites along Alternative Segment M versus no sites on Proposed Segment N.

D.3.6 WEST FORT SAGE MOUNTAINS ALTERNATIVE SEGMENT P VERSUS PROPOSED PROJECT SEGMENT Q

Relative environmental advantages of Alternative Segment P include:

- A shorter length (17.6 miles vs. 21 miles for Proposed Segment Q) would result in less construction disturbance.
- Only three significant cultural resources site would be potentially impacted versus five sites along Proposed Segment Q.

However, Alternative Segment P was found to be environmentally inferior to Proposed Segment Q because of the following significant environmental disadvantages:

- Land use impacts would be substantially greater due to closer proximity to Long Valley residential development and crossing of the Fort Sage OHV Area and the Doyle Wildlife Area.
- Greater visual impacts would occur due to closer proximity to a major travel corridor and effects on the scenic quality of the Fort Sage Mountains.

D.3.7 LONG VALLEY ALTERNATIVE SEGMENTS S, U, Z, and WCFG VERSUS PROPOSED PROJECT SEGMENTS T and W

Alternative Segments S and U were found to have reductions in visual and land use impacts due to moving the transmission line further away from the Lassen Red Rocks Scenic Area. However, impacts on biological resources, cultural resources, geology, hydrology, traffic, air quality, and energy would be greater than for the Proposed Project Segment T. Impacts on biological resources would be greater along Segments S and U because of the crossing of wetland habitats of Long Valley Creek twice, including potentially greater bird collision impacts in this important year-round habitat and migration corridor. These stream crossings would also increase the potential for hydrological impacts. In addition Segments S and U have a greater fault potential and zones of high corrosivity and erodibility within the stream channels. Furthermore, Segments S and U would require crossing U.S. 395 twice, thus increasing traffic and public safety impacts.

For the reasons stated above, on balance Proposed Segment T is considered to be the environmentally superior alternative under CEQA requirements. As noted above in Section D.2, the NEPA Lead Agency

(BLM)-preferred alternative is the combined Alternative Segments S and U on the basis of significant, unmitigable visual and land use management impacts on the Lassen Red Rocks Scenic Area (designated as a scenic area in the BLM Lahontan Resource Management Plan) associated with Proposed Segment T.

Alternative Segment Z would result in avoidance of a residential subdivision that would otherwise be crossed by Proposed Segment W. There are no clear distinctions between the two routes in any other issue area, so Alternative Segment Z is considered environmentally superior.

Alternative Segment WCFG would offer reductions in impacts on biological resources through avoidance of some deer winter range and meadow/riparian habitats and reduced impacts on the Hallelujah Junction Wildlife Area; however, it would result in substantially greater visual and land use impacts because of a closer proximity to U.S. 395 and to residences at Border Town. Therefore, Proposed Segment W is considered environmentally superior to Alternative Segment WCFG for this portion of the route.

D.3.8 PEAVINE PEAK ALTERNATIVE SEGMENT X-EAST VERSUS PROPOSED PROJECT SEGMENT Y

The primary advantage of Alternative Segment X-East is avoidance of potential impacts on three cultural resources sites along Proposed Segment Y and minor reductions in impacts on vegetation and wildlife species due to the fact that this alignment is in a more disturbed area. However, major disadvantages are associated with long-term land use impacts. Alternative Segment X-East would be located in very close proximity to several residences at the end of Hoge Road, thus subjecting them to visual impacts, public safety and health concerns, and noise impacts. Therefore, Proposed Segment Y is considered the environmentally superior route.

D.4 COMPARISON WITH NO PROJECT ALTERNATIVE

Under the No Project Alternative, the impacts associated with constructing and operating the Proposed Project would not occur. However, as discussed in Section A.6.2, SPPCo would need to augment its existing facilities and add new transmission and generation capacity to compensate for existing system limitations and future growth. Section B.3 of this EIR/S discusses the various system alternatives that SPPCo assessed in its selection of the Alturas Transmission Line Project as its preferred project to bring forward for permitting. The system alternatives considered included generation, system enhancement, alternative technologies, and transmission alternatives. These alternatives, in addition to the Nevada Route Alternative that was identified during the scoping period, were assessed in this EIR/S for their ability to satisfy the existing and projected needs of SPPCo's electric power distribution system (see Section A.6, Purpose and Need and Sections B.3.4.3 through B.3.4.6). This analysis concluded that only the various Transmission Alternatives evaluated in Section B.3.4.6.2 were capable of supplementing SPPCo's system in such a manner that existing limitations could be mitigated and future growth

accommodated. This evaluation was conducted to provide information on the possible options available to SPPCo in the event that the No Project Alternative is deemed preferable.

In Section B.3.4.6.2, the transmission alternatives capable of satisfying the project objectives were assessed for their potential environmental impacts. Since these alternatives have only been preliminarily studied by SPPCo, no site-specific information was available. Therefore, the evaluation of these alternatives in Section B.3.4.6.2 is limited to a qualitative assessment. Based on the analysis presented in Section B.3.4.6.2, none of the Transmission Alternatives were found to offer environmental advantage in comparison to the Proposed Project and therefore, were eliminated from further consideration under CEQA (see Section B.3.2 for a discussion of CEQA alternative screening criteria. Considering the analysis in Section B.3.4.6.2, as well as the issue area-by-issue area analysis of the No Project Alternative in Section C.2 - C.13, the Proposed Project is considered to be environmentally superior to these alternatives (including the No Project Alternative). The following factors were taken into consideration in reviewing the candidate Transmission Alternatives in the event the No Project Alternative was selected.

- (1) **Potential Environmental Impacts.** In order for the Proposed Project, or any transmission or generation alternative, to improve service reliability to the Reno/Lake Tahoe area, connection to SPPCo's North Valley Road Substation would be required. This need is based on existing limitations of the Tracy-to-North Valley Road connections and projected load increases in the Reno/Lake Tahoe area. For each Transmission Alternative identified, in order to access the North Valley Road Substation, the route would likely need to cross a severely constrained and rapidly growing area of northern Sparks and Reno. These growing urban areas are also located within the Truckee Meadows Air Basin, a non-attainment classified air basin for both State and Federal ambient air quality standards. This routing could result in significant property ownership constraints and potentially significant land use (densities range from 3 to 21 dwelling units per acre), visual, and air quality impacts. In addition, given that the alternative would be traversing an urban area, electric and magnetic field (EMF) concerns would be significant, since the separation distances between the alternative and sensitive receptors would be restricted because of existing development.
- (2) **Utility Corridor Concerns.** The Transmission Alternatives would travel primarily within designated utility corridors. Under each transmission alternative scenario (individual or collective), the construction of about 15 miles of transmission line (in most cases 345 kV line) would be required from Tracy to SPPCo's North Valley Road Substation, traversing the City of Sparks and northern Reno area. An existing SPPCo transmission line corridor could be utilized by the alternatives. This corridor contains a 345 kV transmission line and a 120 kV transmission line. To comply with WSCC Operating Criteria, adequate separation distances between transmission lines would be required to avoid simultaneous failures. In rural environments, separation distances range from the span between structures of approximately 1,000 feet; (LADWP recommended) to 2,000 feet (approved for the Southwest Intertie Project in most locations). In urban environments, the proposed Transmission Alternatives could be sharing an existing corridor that includes 345 kV and 120 kV lines. This corridor traverses existing urban development and in many places encroaches to the edge of the existing development (generally residential; 3 to 21 dwelling units per acre). The expansion

of the corridor to include an additional 345 kV line (or multiple smaller lines) could require the demolition of existing residences.

- (3) **Permitting, Design, and Construction Timelines.** SPPCo has only conducted preliminary technical feasibility analyses for the Transmission Alternatives considered in this EIR/S, except for the Nevada Route Alternative which was identified during EIR/S scoping. Given the time required to permit, design, and construct projects of this magnitude, SPPCo estimates that these alternative facilities would not be available for operation until the year 2000. Given SPPCo's existing system limitations, SPPCo is currently unable to operate within prudent, WSCC Operating Criteria. This existing system shortcoming will be exacerbated as loads continue to grow (see Section A.6, Purpose and Need). Because SPPCo is a WSCC member utility, failure of the SPPCo system could also have ramifications on the service provided by other WSCC utilities. Interruptions of service in the Reno/Lake Tahoe area would impose economic impacts on all affected commercial and industrial activities. In addition, such interruptions could affect the responsiveness of emergency services. However, since permitting time lines are the responsibility of the Applicant, the timing implications of the Transmission Alternatives have been given only minimal consideration in this analysis.

D.5 ALTERNATIVE ALIGNMENTS COMPARISON MATRIX

Table D.5-1 presents the comparison of the Proposed Project and alternative alignments, by environmental issue area and impact parameter for Class I and Class II impacts. Overall conclusions based on this matrix are presented in Section D.2 (Environmentally Superior Alternative) and Section D.3 (Comparison of Alternatives).

Table D.5-1 Alternative Alignments Comparison Matrix

| PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS | | | | | | | | |
|--|---|--|---|---|---|---|--|--|
| ENVIRON. IMPACT PARAMETER | Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi) | Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi) | Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi) | ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.) | Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2) | W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi) | Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi) | Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi) |
| AIR QUALITY | | | | | | | | |
| Class I: No impacts identified. | | | | | | | | |
| Class II Impacts: | | | | | | | | |
| Particulate emissions from construction and maintenance activity | Segment B emissions 50% less than Segment A. | Segment D, F, G, H, I emissions 45-65% greater than Segment E. | Segment J: 35% more emissions than Segment K. | Segment ESVA: 10% more emissions than Segment L. | 30% increase in emissions on Segment M. | Segment P: 25% less construction emissions. | Alternatives are slightly longer; may result in more emissions. | Only minor differences. |
| BIOLOGICAL RESOURCES | | | | | | | | |
| Class I Impacts: None identified. | | | | | | | | |
| Class II Impacts: | | | | | | | | |
| Removal, disturbance, or degradation of plant communities and wildlife habitat. | Alt. Segment B would have reduced impacts on juniper woodland, big sagebrush scrub, montane meadow, volcanic gravels, and low sagebrush. Proposed Segment A would result in a slightly greater impact of raptor predation enhancement on nearby sensitive Pit River Valley communities. | The Madeline Plains alternatives would have substantially greater impacts on juniper and sagebrush habitats and their value to pronghorn, deer, and sage grouse due to Segment D, but similar general habitat impacts within the Madeline Plains proper. | Alternative Segment J would have substantially greater impacts on big sagebrush scrub, juniper woodland, and silver sagebrush scrub and their associated value to wildlife, but lesser impacts on the volcanic vertisols community. | Greater impacts for Alt. Segment ESVA (pronghorn antelope kidding areas & winter range, sage grouse, and wetlands) due to absence of existing access and roughness of terrain which will require more surface disturbance. Greater cumulative effects of ESVA with Tuscarora project. | Alternative Segment M would have greater impacts on big sagebrush scrub and sand dune habitats, but lesser impacts on chenopod scrub. Both alignments would have similar overall impacts on general wildlife habitat value. | Proposed Segment Q would have greater impacts on juniper woodland, sage/bitterbrush, and sand dune communities and associated deer habitat, but lesser impacts on big sagebrush scrub and pygmy rabbit habitat. However, Alt. Segment P would cross and adversely affect the CDFG Doyle Wildlife Area and its associated deer winter range. | Proposed Segment T and Alternative Segments S and U would have somewhat similar impacts in the removal/disturbance of plant communities (e.g., juniper woodland and sagebrush/bitterbrush), however S and U combined would be longer and would enter and cross (twice) the sensitive (waterfowl, shorebirds, bank swallows, potential willow flycatcher) habitats in the bottomlands of Long Valley Creek. | There is little difference in impacts on plant communities and animal habitats between Proposed Segment Y and Alternative Segment X-East, except that X-East is already in a more disturbed condition. |

Table D.5-1 Alternative Alignments Comparison Matrix

| PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS | | | | | | | | |
|---|--|---|--|--|--|--|--|---|
| ENVIRON. IMPACT PARAMETER | Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi) | Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi) | Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi) | ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.) | Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2) | W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi) | Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi) | Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi) |
| | | | | | | | <p>Segment W would remove or disturb some deer winter range and montane meadow habitat including impacts on CDFG Hallelujah Junction Wildlife Area, which Segment WCFG would help to avoid.</p> <p>Segment Z, except for its slightly longer length would have no appreciable differences in impacts from those of the corresponding portion of Segment W.</p> | |
| Removal or disturbance of special status plant populations. | Proposed Segment A would potentially disturb up to 12 occurrences of 4 species/Alternative Segment B would disturb one occurrence of one species | The Madeline Plains alternatives would potentially disturb up to 46 occurrences of 4 species/Proposed Segment E only 15 occurrences of 6 species. | Proposed Segment K would potentially disturb 10 occurrences of 5 species/Alternative Segments I and J only 7 occurrences of 4 species. | Proposed Segment L would potentially disturb 49 occurrences of 7 species; Alternative Segment ESVA, 77 occurrences of 7 species. | Alternative Segment M would potentially disturb 2 occurrences of 1 species/ Proposed Segment N only 1 occurrence of 1 species. | Proposed Segment Q would potentially disturb 5 occurrences of 2 species/Alternative Segment P only 3 occurrences of 1 species. | Neither Proposed Segments T and W nor the Alternatives would have impacts on special status plants. | Both alignments would traverse 1 isolated occurrence of a special status plant and an altered andesite community. |

Table D.5-1 Alternative Alignments Comparison Matrix

| PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS | | | | | | | | |
|--|---|---|---|--|---|--|--|--|
| ENVIRON. IMPACT PARAMETER | Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi) | Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi) | Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi) | ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.) | Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2) | W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi) | Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi) | Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi) |
| Construction disturbance to wildlife or indirect impacts of increased access on natural communities. | Greater impact for Prop. Segment A (e.g., Swainson's hawk, bald eagle, sandhill crane) due to greater length, much less developed character, and proximity to prime habitat areas of Pit River and Warm Springs Valley. | Greater impacts for Madeline Plains alternatives (e.g., sandhill crane, sage grouse, Swainson's hawk, prairie falcon) due to greater length, less developed character, access development magnitude, and habitat variety crossed. | Greater impacts for Alt. Segment J (e.g., pronghorn, deer, raptors, sage grouse) due to greater existing isolation/less developed character, access development magnitude, and habitat variety crossed. | Greater impacts for Segment ESVA due to isolated location and greater access development (Swainson's hawk, sage grouse, pronghorn, mule deer, loggerhead shrikes). Greater cumulative effects of ESVA with Tuscarora project. | Slightly greater impacts for Prop. Segment N (e.g., pronghorn, deer) due to slightly less developed character of area away from road and Wendel. | Slightly greater impacts for Prop. Segment Q (e.g., deer, sage grouse, Swainson's hawk, short-eared owl) due to greater length, isolation/less developed character, and habitat variety of area crossed. | Probably slightly greater impacts for Alternative Segments S and U (vs. T) due to greater length and habitat variety. No significant differences with Segment Z. Reduced impacts with WCFG due to greater avoidance of meadow/riparian habitats. | Slightly greater impacts with Segment Y due to existing less developed character. |
| Injury and mortality due to collision or electrocution. | Segment B would result in reduced bird collision potential. | Greater collision potential for Madeline Plains alternatives due to presence, right angle turn(s) of line in sensitive Madeline Plains areas (cranes, waterfowl, and other shorebirds). | Slightly greater collision potential for Prop. Segment K due to greater length in the sensitive Madeline Plains area (sandhill cranes, waterfowl, and other shorebirds). | No significant difference. | Possible slightly greater collision potential for Alt. Segment M due to closer proximity to floor of Honey Lake Valley and its associated waterfowl and shorebird habitats. | Possible slightly greater collision potential for Prop. Segment Q due to greater length, longer crossing of eastern Honey Lake Valley, and perpendicular crossing of Dry Valley. | Greater collision potential for Alternative Segments S and U (over T) due to two crossings of Long Valley Creek-bottom area, greater length, and perpendicular direction change within creek bottom area. No significant differences with Segment Z. Possible slightly greater collision impacts with Segment WCFG (vs. portion of W) due to line direction changes. | Negligible differences among these alternatives. |

Table D.5-1 Alternative Alignments Comparison Matrix

| PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS | | | | | | | | |
|---|---|---|--|--|--|---|---|---|
| ENVIRON. IMPACT PARAMETER | Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi) | Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi) | Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi) | ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.) | Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2) | W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi) | Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi) | Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi) |
| CULTURAL RESOURCES | | | | | | | | |
| Class I Impacts | | | | | | | | |
| Potentially unavoidable adverse effects on a significant cultural resource site. | | | Potential impacts to 2 historic sites on Proposed Segment K, with potentially difficult to mitigate impacts associated with setting, feeling, or association for potentially NRHP eligible site under criterion (a). | Potential impacts to one site on Alt. Segment ESVA vs. no Class I impacts on Proposed Segment L. | | | Potential impacts to a historic site on Alt. Segment S with potentially difficult to mitigate impacts associated with setting, feeling, or association for potentially NRHP eligible site under criterion (a). | |
| Class II Impacts | | | | | | | | |
| Surface removal and disturbance of surface or subsurface cultural resource sites. Increased vandalism or unauthorized collection at cultural resource sites. Impacts to integrity of setting, feeling, or association. | Proposed Segment A would have potentially significant impacts on 17 sites. There would be potentially significant impacts on 5 sites for Alternative Segment B. | Proposed Segment E would have potentially significant impacts on 12 sites. Alternative Segment D would have potentially significant impacts on 10 sites. Segment G would have potentially significant impacts on 1 site, and potential minor adverse impacts on 1 site. | Proposed Segment K would have potentially significant impacts on 9 sites. Alternative Segment J would have potentially significant impacts on 2 sites, and potential minor adverse impacts on 2 sites. | Potentially significant impacts on 7 sites on Segment ESVA vs 13 potentially significant impacts on Proposed Segment L and Class II impacts; sites on Segment ESVA contain a higher percentage of significant data. | Alternative Segment M would have potentially significant impacts on 2 sites. Proposed Segment N would have potentially significant impacts on no sites. | Proposed Segment Q would have potentially significant impacts on 5 sites. Alternative Segment P would have potentially significant impacts on 3 sites. | Alternative Segments S and U (combined) would have potentially significant impacts on 2 sites. Proposed Segment T would have potentially significant impacts on no sites. Alternative Segment Z would have potentially significant impacts on 1 site. The corresponding portion of Proposed Segment W would have potentially significant impacts on the same site. | Proposed Segment Y would have potentially significant impacts on 3 sites. Alternative Segment X-East would have potentially significant impacts on no sites. |

Table D.5-1 Alternative Alignments Comparison Matrix

| PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS | | | | | | | | |
|--|--|---|---|--|---|---|---|--|
| ENVIRON. IMPACT PARAMETER | Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi) | Madeline Plains Alternative Segments D,E,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi) | Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi) | ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.) | Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2) | W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi) | Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi) | Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi) |
| | | | | Cumulative impacts of Segment ESVA would be greater due to larger area of disturbance required for 2 separate corridors (Tuscarora). | | | Alternative Segment WCFG would have potentially significant impacts on 3 sites. The corresponding portion of Proposed Segment W would have potentially significant impacts on no sites. | |
| ENERGY AND UTILITIES | | | | | | | | |
| Class I Impacts: None identified | | | | | | | | |
| Class II Impacts | | | | | | | | |
| Disruption of service if excavation damages other utility lines. | Potential for disruption of utility service during construction would be higher, because of a greater number of crossed overhead electrical lines, than for the Proposed Project segment. | Density of overhead utilities along the proposed alternative alignments are comparable to those for the Proposed Project. | Density of utilities is less along alternative J than for Proposed Segment K. | Density of utilities is low and comparable to those for Proposed Segment L. | Impacts would be comparable to those of the Proposed Segment N. | Potential for disruption of utility service would be similar to that for the Proposed Project | Impacts for the alternatives would be greater than those of the Proposed Project. | Impacts would be comparable to those of the Proposed Project. |
| GEOLOGY, SOILS, AND PALEONTOLOGY | | | | | | | | |
| Class I Impacts: None identified | | | | | | | | |
| Class II Impacts | | | | | | | | |
| Ash fall from major volcanic eruption. | Regional impact - negligible differences between alternative and proposed segments. | | | | | | | |

Table D.5-1 Alternative Alignments Comparison Matrix

| PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS | | | | | | | | |
|---|--|--|---|---|---|---|---|--|
| ENVIRON. IMPACT PARAMETER | Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi) | Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi) | Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi) | ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.) | Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2) | W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi) | Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi) | Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi) |
| Fault displacement of structure foundation causing collapse of structure; or displacement between structures causing stress on wires. | Proposed Segment A crosses a potentially active fault; Alt. Segment B does not. | Proposed Segment E crosses a potentially active fault twice; Alt. Segment D crosses once, but would have to connect to either Segment I or J (both of which cross faults). | No significant differences. | No significant differences. | No significant differences. | Both segments cross active faults, but Alt. Segment P is also along a fault with unknown potential, requiring further studies that could result in a required route shift if fault is found to be active. | Alternative Segment S crosses potentially active fault; Segment T does not. However Segment S fault is not highly active. No significant differences for other segments. | No significant differences. |
| Earthquake shaking could damage structures or substations. | A major earthquake would result in ground shaking across the entire region; there would be no significant differences in impacts between route segments. | | | | | | | |
| Landslides/slope failure caused by excavation, undercutting, loading, earthquakes, or blasting. | Segment B would probably require less blasting than Segment A. | Segment D would require more blasting than Segment E. | Segment J would require more blasting than Segment K. | Alternative Segment ESVA would require more blasting than Proposed Segment L. | No significant differences. | No significant differences. | No significant differences. | No significant differences. |
| Restricted access to or loss of minerals or energy resources. | No significant impacts identified. | | | | | | | There is a small potential source of crushed aggregate on Alternative Segment X-East. |
| Construction would result in grading and ground disturbance (erosion impacts). | Segment B would require less grading and potential for erosion. | Alternative Segment D would require substantially more grading & road improvement than Proposed Segment E. | Proposed Segment K would require much less grading than Alternative Segment J. | More grading would be required for Segment ESVA. | Alternative Segment M would require less grading than Segment N. | No significant differences. | Alternative Segment S (with Segment U) would require slightly more grading than Segment T. No significant differences for other segments. | No significant differences. |

Table D.5-1 Alternative Alignments Comparison Matrix

| PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS | | | | | | | | |
|--|---|---|---|---|--|---|--|--|
| ENVIRON. IMPACT PARAMETER | Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi) | Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi) | Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi) | ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.) | Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2) | W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi) | Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi) | Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi) |
| HYDROLOGY | | | | | | | | |
| Class I Impacts: None identified. | | | | | | | | |
| Class II Impacts | | | | | | | | |
| Erosion due to construction in or near streams or floodplains and resultant sedimentation and water quality impacts. | Alternative Segment B has less length in 100-year floodplain than Proposed Segment A. | No significant differences. | No significant differences. | Alternative Segment ESVA has less length in 100 year floodplain than Proposed Segment L. | No significant differences. | Alternative Segment P has greater chance of impacting perennial stream in Long Valley. | Proposed Segment T has no stream crossings and Alternative Segments S and U feature stream crossings. No significant differences for other segment pairs. | No significant differences. |
| Flooding during construction could interfere with construction and affect water quality. During operations, flooding could add to scour and erosion impacts. | Segment B has less length in 100-year floodplain. | No significant differences. | Alternative Segment I and J crosses more floodplains and streams. | No Significant differences. | No significant differences. | No significant differences. | No significant differences. | |
| Sediment loading of surface waters could result from construction. | No significant differences. | Alternative Segment D would require more grading & road improvement; more likely to cause erosion and sediment loading. | No significant differences. | No significant differences. | No significant differences. | No significant differences. | No significant differences. | |
| Excavation in areas of shallow groundwater may interrupt, redirect, or reduce flow to springs or wetlands. | Negligible differences. | Negligible differences. | Negligible differences. | No significant differences. | Proposed Segment N has more chance to affect groundwater during construction, but conditions are not well known. | Alternative Segment P is more likely to affect groundwater in Long Valley area. | Negligible differences. | |

Table D.5-1 Alternative Alignments Comparison Matrix

| PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS | | | | | | | | |
|--|---|---|--|--|---|--|--|---|
| ENVIRON. IMPACT PARAMETER | Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi) | Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi) | Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi) | ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.) | Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2) | W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi) | Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi) | Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi) |
| Blasting may affect groundwater flow paths. | Negligible differences. | Alternative Segment D would require more blasting. | Alternative Segment J would require more blasting. | Alt. Segment ESVA would require more blasting. | Negligible differences. | Negligible differences. | Negligible differences. | |
| LAND USE, RECREATION, AND EDUCATIONAL, RELIGIOUS, OR SCIENTIFIC USES | | | | | | | | |
| Class I Impacts | | | | | | | | |
| Degradation of quality of residential uses as a result of permanent change in character of residential environment due to presence of project structures (e.g., visual impacts and EMF concerns). | Would have a greater impact on residential uses along Alternative Segment B because it would impact more sensitive land uses - several residences and a ranch compared to two residences for Proposed Segment A. | Alternative route would impact the same number of residences as Proposed Segment E; would have a greater impact on residential uses because it would cross near several undeveloped residential subdivisions and closer to a residence than Segment E. | Alternative Segment J would not impact sensitive residential uses, whereas Proposed Segment K would impact two residences. | Alt. Segment ESVA would avoid impacts on all but one residence; Proposed Segment L would potentially affect six residences. | Same impact on residential uses. | Alternative Segment P would have a greater impact on residential uses than Proposed Segment Q because it would cross closer to the rural residential development of Long Valley and to the towns of Doyle, Constantia, and Omira; it would also cross near a partially developed residential subdivision. | Alternative Segment Z would have less impact on residential uses because it would avoid crossing a partially developed residential subdivision. Segment WCFG would have a greater impact on residential uses because it would pass close to a dozen residences at Border Town. Other Segments would have same impacts as Proposed Project. | Alternative Segment X-East would impact more sensitive residential uses - an apartment complex and two residences compared to no residences for Proposed Segment Y. |
| Degradation of quality of recreational uses as a result of change in character of recreational environment due to presence of project structures (e.g., visual impacts). | Alternative Segment B would have minor adverse effects on city golf course, but Proposed Segment A would have minor adverse effects on recreational uses of Modoc NF. | The Madeline Plains alternative would have a greater impact than Proposed Segment E because it would cross an area that receives relatively greater recreational use, and it would cross closer to a fishing pond. | Segment J would have a greater impact than Proposed Segment K because it would cross an area that receives relatively greater recreational use. | Alt. ESVA would avoid impacts of Proposed Segment L on Tule Patch Spring Rest Area but be located on border of the Five Springs WSA. | Same impacts on recreational use. | Segment P would have a greater impact on recreational uses than Proposed Segment Q because it would cross a larger portion of the Fort Sage OHV Area. | Alternative Segments S and U would have less impact on recreational uses than Proposed Segment T because they would cross further away from the Lassen Red Rocks Scenic Area and would not have a Class I impact on this recreation area. | Same impacts on recreational uses. |

Table D.5-1 Alternative Alignments Comparison Matrix

| PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS | | | | | | | | |
|---|--|---|---|---|---|---|---|---|
| ENVIRON. IMPACT PARAMETER | Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi) | Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi) | Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi) | ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.) | Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2) | W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi) | Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi) | Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi) |
| Class II Impacts | | | | | | | | |
| Temporary loss of use of grazing land within and outside the ROW and disturbance to grazing animals during construction. | Alternative Segment B would have less impact because it would cross less grazing land than Prop. Segment A. | Same impacts on grazing land. | Same impacts on grazing land. | Slightly greater impacts on grazing land along Segment ESVA. | Same impacts on grazing land. | Alternative Segment P would have less impact because it would cross less grazing land than Proposed Segment Q. | Alternative Segments would have less impact on grazing land because they would cross less grazing land than the Proposed Project. | Segment X-East would have less impact because it would cross less grazing land than Proposed Segment Y. |
| Temporary removal of sections of fencing and opening of gates along grazing allotments and loss of grazing animals during construction. | Segment B would have less potential for loss of animals because it would cross less grazing land than Proposed Segment A. | Same potential for loss of animals. | Same potential for loss of animals. | No significant difference. | Same potential for loss of animals. | Alternative Segment P would have less impact because it would cross less grazing land than Segment Q. | Alternative Segments would have less potential for loss of animals because they would cross less grazing land than the Proposed Project. | Segment X-East would lower impacts because it would cross less grazing land than Proposed Segment Y. |
| Temporary loss of use of cropland during construction. | Not of significant concern. | The Madeline Plains alternatives would have greater impact because they would cross more cropland than Proposed Segment E. | Slightly more cropland crossed by Segment I & J than Proposed K. | No significant difference. | Not of significant concern. | Not of significant concern. | Not of significant concern. | Not of significant concern. |
| Disturbances to residential, recreational, and agricultural uses due to increased human intrusions into relatively undeveloped areas, as a result of improved access. | Alternative Segment B would have less impact because it crosses land that has more existing access routes. | Similar increases in opportunity for human intrusion into undeveloped areas. | Increases in opportunity for human intrusion into undeveloped areas with Alt. Segment J vs. no increase for Proposed Segment K. | Alternative Segment ESVA would have a greater increase in opportunity for human intrusion in undeveloped areas. | Similar increases in opportunity for human intrusion into undeveloped areas. | Segment P would have less increase in opportunity for intrusion than Proposed Segment Q, because it would cross land that has more existing access routes. | Alternative Segments would have less increase in opportunity for intrusions than the Proposed Project, because it would cross land that has more existing access routes. | Segment X-East would have less impact than Proposed Segment Y, because it would cross land that has more existing access routes. |

Table D.5-1 Alternative Alignments Comparison Matrix

| PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS | | | | | | | | |
|--|---|--|--|---|--|---|--|--|
| ENVIRON. IMPACT PARAMETER | Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi) | Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi) | Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi) | ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.) | Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2) | W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi) | Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi) | Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi) |
| Cumulative construction impacts with other future projects in project area. | Similar. | Similar. | Similar. | Alternative Segment ESVA would have greater extent of impacts due to separation from Tuscarora pipeline route vs Proposed Segment L which parallels the Tuscarora corridor. | Similar. | Similar. | Segments S and U would have greater impacts than Proposed Segment T because it would be closer to the development of future pozzolan facilities. | Similar. |
| NOISE | | | | | | | | |
| Class I Impacts: None identified | | | | | | | | |
| Class II Impacts | | | | | | | | |
| Sensitive receptors could be disturbed by construction noise. | Alternative Segment B: 10 receptors would experience severe, short-term noise impact; Proposed Segment A includes 1 such sensitive receptor. | The alternatives contain 5 sensitive receptors that would experience severe impact, whereas Proposed Segment E has none. | Neither Segments I and J nor Proposed Segment K have severely impacted receptor. | No sensitives receptor on Alt. Segment ESVA experiencing severe impact; 3 receptors on Proposed Segment L exposed to severe impact. | One sensitive receptors along Segment M appearing severe construction noise, with none present along Segment N. | Two sensitive receptors along Segment P and one along Proposed Segment Q severely impacted. | The alternative contains no sensitive receptors; the proposed route contains one. One receptor along Segment WCFG severely impacted, and none along Proposed Segment W. | Selection of the X- East Alignment would result in severe noise at three receptors, which would not occur with selection of Segment Y. |
| PUBLIC SAFETY AND HEALTH | | | | | | | | |
| Class I Impacts: None identified | | | | | | | | |
| Class II/III Impacts | | | | | | | | |
| Potential exposure to EMFs of cumulative increase in population in project area. | Alternative Segment B area more likely to attract future residential development and result in greater exposure. | Similar potential for exposure of a larger population. | Alternative Segment J would have a greater potential for exposure of a larger population because it would cross near the Ravendale Elementary School. | Slightly less potential for Alt. Segment ESVA due to more remote location. | Similar potential for exposure of a larger population. | Similar potential for exposure of a larger population. | Similar potential for exposure of a larger population, except for Alternative Segment WCFG which would have greater potential impacts because it crosses near existing residential development | Alt. Segment X-East would have greater potential impacts because it crosses near existing residential development that is more likely to attract future development. |

Table D.5-1. Alternative Alignments Comparison Matrix

| PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS | | | | | | | | |
|---|--|---|---|---|---|---|--|--|
| ENVIRON. IMPACT PARAMETER | Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi) | Madeline Plains Alternative Segments D,E,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi) | Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi) | ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.) | Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2) | W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi) | Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi) | Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi) |
| SOCIOECONOMICS AND PUBLIC SERVICES | | | | | | | | |
| Class I Impacts: None | | | | | | | | |
| Class II Impacts: There would be similar potential impacts on property values and public services for all proposed and alternative segments. | | | | | | | | |
| TRANSPORTATION AND TRAFFIC | | | | | | | | |
| Class I Impacts | | | | | | | | |
| An accident or structural failure could potentially result in blockages of highways and/or rail facilities; this would be compounded by the cumulative effects of multiple accidents in the event of a major catastrophe. | Similar impacts since both segments cross Route 299. | Similar impacts. | Alternative Segments I and J have slightly less impacts due to distance from U.S. 395. | Less potential for Alt. Segment ESVA due to separation from U.S. 395. | Proposed Segment N has less impacts since alternative crosses S railroad tracks twice, whereas proposed segment doesn't cross tracks. | Similar impacts. | Proposed Segment T has less impacts since Alternative Segments S and U add two additional UP railroad and U.S. 395 crossings. | Similar impacts. |
| Class II Impacts | | | | | | | | |
| Construction roadway blockage and traffic congestion resulting in increased accident risk, and restricted emergency access. | Proposed Segment A affects less roadways (3 vs. 5); both affect Route 299. | Alternative routes are farther from U.S. 395, thereby minimizing traffic disruptions. | Alternative Segment J is farther from U.S. 395, thereby reducing traffic disruptions. | Slightly less potential for Alt. Segment ESVA due to separation from U.S. 395. | Similar impacts. | Similar impacts. | Proposed Project preferred since it is farther from U.S. 395, thereby minimizing traffic disruptions. | Similar impacts. |
| Interference with navigable airspace and decreased safety for aviation activities. | Alternative Segment B is closer to Alturas Municipal Airport and impacts would be much more difficult to mitigate. | Proposed route least disruptive to crop spraying. F less disruptive than G. | Proposed Segment K is closer to airport, but Alt. Segment I is in crop dusting area. | No difference. | Similar impacts. | Alternative Segment P is closer to Herlong Airport. | Similar impacts. | Similar impacts. |

Table D.5-1 Alternative Alignments Comparison Matrix

| PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS | | | | | | | | |
|--|---|--|--|--|---|---|---|--|
| ENVIRON. IMPACT PARAMETER | Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi) | Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi) | Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi) | ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.) | Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2) | W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi) | Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi) | Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi) |
| VISUAL RESOURCES | | | | | | | | |
| Class I Impacts | | | | | | | | |
| Significant degradation of scenic quality and creation of moderate-to-strong visual contrast and landscape change. Generally has high degree of visual access. | Alternative Segment B would have greater visual impacts because its 230 kV double circuit line and substation would be more prominent and located closer to residential and recreational development in the City of Alturas. | Use of the Madeline Plains alternatives would have less visual impacts because it would have relatively restricted visual access, would generally appear as a subordinate background feature, and would not be located as close to U.S. Highway 395. | Segment J would have less visual impacts than Proposed Segment K because it would have significantly less visual access, visual contrast, and visual impact on views from U.S. Highway 395, but Segment I would have Class I visual impacts. | Alternative Segment ESVA would have lower level of visual impacts due to avoidance of U.S. 395 corridor. | Similar impacts. | Alternative Segment P would have substantially greater visual access due to proximity to a major travel corridor and would have an adverse impact on the scenic quality of the Fort Sage Mts. | Alternative Segments S and U would have less visual impact than Proposed Segment T because they would avoid significant degradation of views to the Lassen Red Rocks Scenic Area. Alternative Segment WCFG (from WN06-WN10) would have greater visual impact than Proposed Segment W because it would be located closer to U.S. Hwy 395 (for greater length) and residences at Border Town. | Segment X-East would have greater visual impacts because it would be located closer to the Hoge Road Subdivision and would have greater prominence as a foreground visual feature. |
| Class II Impacts | | | | | | | | |
| Short-term impaired scenic quality resulting from the presence of equipment, materials and workforce during construction, and the construction of access and spur roads. | Alternative Segment B would have greater impacts because it would be located closer to the City of Alturas and to the staging area near the Alturas Lumber Yard. However, Segment A would result in excessive visual access to Alturas Substation through cleared juniper forest. | Proposed Segment E would have greater impacts because it would be located closer to U.S. Highway 395 and to the staging area near E07 and the gravel pits. | Alternative Segment J would have less impacts because it would have significantly less visual access and be located further away from U.S. 395. | Alternative Segment ESVA would have significantly lower level of visual impacts due to avoidance of U.S. 395 corridor. | Segment M would have greater impacts because it would be located closer to the staging area on Wendel Road. | Alternative Segment P would have greater impacts because it would have substantially greater visual access due to its proximity to a major travel corridor. | Segments S and U would have less impacts than Proposed Segment T because they would be located further away from the Lassen Red Rocks Scenic Area. | Segment X-East would have greater impacts than Proposed Segment Y because it would be located closer to a residential area and would have greater prominence as a foreground visual feature. |